NORTH PACIFIC OCEAN, DECEMBER 1935

By WILLIS E. HURD

Atmospheric pressure.—Following a period of 2 months during which atmospheric pressures were abnormally high over the northern half of the North Pacific Ocean, conditions changed abruptly in December 1935, and pressures below normal prevailed over the entire eastern half of the ocean as well as over a portion of the Tropics extending almost as far west as the Philippine Islands. Through much of the Aleutian area and southern Alaskan waters pressures were much below the normal, the greatest recorded departure being —0.30 inch at Dutch Harbor. North of the fortieth parallel most days following the 10th, and some days preceding that date, had barometer readings below 29 inches. The lowest recorded barometer of the month was 28.32, read on the British steamship *Empress of Russia*, near 50½° N., 167½° W., on the 26th. A similarly low reading, 28.33 inches, was made on the American steamship *President Jefferson*, in nearly the same position on the 24th.

While anticyclones appeared sporadically over the ocean, high pressures prevailed only off the China and California coasts, the latter being weaker than normal and unusually restricted in area.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, December 1935, at selected stations*

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow	30.14	+0.11	30.66	24	29.66	20
Dutch Harbor	29.26	−.30	30.06	3	28.46	26
St. Paul	29.52	−.06	30.18	3	28.86	26
Kodiak	29.35	−.21	30.28	22	28.52	14
Juneau	29.65	−.14	30.30	21	28.90	10
Tatoosh Island	29.95	−.01	30.43	19	29.21	11
San Francisco	30.08	−.04	30.33	7	29.76	29
Mazatlan	29.93	.00	30.04	20	29.80	13
Honolulu	29.99	−.02	30.10	1	29.78	6
Midway Island	29.93	−.08	30.24	19	29.56	31
Guam	29.79	−.08	29.90	22	29.54	3
Manila	29.87	+.01	30.00	12, 13	29.62	8, 31
Hong Kong	30.11	.....	30.28	22	29.89	8
Naha	30.11	+.13	30.36	22	29.80	26
Chichishima	30.06	+.06	30.22	16	29.74	9
Nemuro	29.89	.....	30.44	27	29.40	1, 10

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

Cyclones and gales.—December 1935 was a stormy month over much of the ocean north of the thirtieth parallel, and gales within some part of the great area were of practically daily occurrence. The dates of quietest weather were the 21st–22d and the 30th–31st; and of heaviest weather, including days of most widespread storminess, the 8th to 15th. Gales of force 11, the highest reported for the month, were experienced on the 6th, near 39° N., 170° E.; on the 8th, near 46° N., 158° W.; on the 11th, near 46° N., 156° E.; and on the 14th–15th, within the locality, 39°–41° N., 130°–141° W. On the 24th and 26th, the dates of extreme lowest barometer, south of the central Aleutians, the highest wind velocities reported were of force 9.

At the beginning of December a storm of considerable energy moved eastward from Japan. On the 2d and 3d it rapidly deepened in pressure to lower than 29 inches, and occasioned fresh to whole gales at sea from the Ogasawara Islands northward to the Kurils and thence eastward. Subsequently to the 3d the storm expanded and moved east-southeastward toward Midway Island, accompanied by gale winds, which reached greatest intensity, force 11, on the 6th, as reported by the Japanese steamship *Shoyo Maru*, near 39° N., 170° E. On the 7th the disturbance merged with another great low-pressure area in midocean.

This cyclone moved slowly north and northeast, and by the 13th–14th was central south of the Peninsula and Gulf of Alaska. Throughout the fluctuating course of the storm area, strong to whole gales, more or less scattered in location, occurred over the wide expanse of sea to the northward of the thirtieth parallel. On the 10th–12th the majority of the gales reported were experienced between longitudes 170° E. and 160° W., and from about 30° N. to the Aleutian Islands. On the 13th and 14th the observed gale field was much more restricted in area and farther to the eastward, lying roughly between 40°–50° N., 130°–155° W.

During the 15th to 19th fluctuating cyclonic conditions extended from the Gulf of Alaska southward into middle latitudes, with central pressures continuing below 29 inches through the 18th. Gales were experienced on the 15th to 17th over the general area bounded by latitudes 35°–47° N., longitudes 130°–150° W. The highest wind velocity reported for this period was a south-southeast gale of force 11, encountered by the British steamship *Toorak*, near 39° N., 134° W., on the 15th. On the previous day this ship reported a southwest gale of force 11 6° to the westward.

During the 19th to 26th many scattered gales, at times attaining force 10, occurred along the northern and middle steamship routes between longitudes 160° W. and 175° E. during the prevalence of deep cyclones of the Aleutian LOW type over the north-central part of the ocean. Thereafter gale weather decreased rapidly in area and violence, and by the 30th our records show only one instance of a wind with force as high as 8 experienced by any ship at sea. This instance occurred near 46° N., 128° W.

Typhoons.—Subjoined is a report by Rev. Bernard F. Doucette, S. J., Manila Observatory, of three typhoons occurring in the Far East this month. Our only ship report of a gale experienced during one of these tropical cyclones is that of the American motorship *Jeff Davis*, which was in a wind of force 8 near 19° N., 137° E., on the 3d, in connection with the typhoon of December 1–12.

Tehuantepecers.—Strong winds of the norther type occurred in the Gulf of Tehuantepec, as follows: Of force 7 on the 1st and 5th; of force 8 on the 4th; and of force 9 on the 20th.

Fog.—No fog was reported observed in east longitudes this month, and instances of its occurrence were few in west longitudes. There were 5 days with fog along the northern route between longitudes 130°–160° W.; 2 days with fog off the Washington coast; 5 days with fog off the California coast; and 1 day each with fog off Lower California and in the Gulf of Tehuantepec.

TYPHOONS OVER THE FAR EAST, DECEMBER 1935

BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

Three typhoons for the month of December 1935, are to be reported. Two of these crossed the Philippine Archipelago.

Typhoon, December 1 to 12.—During the last few days of November, pressure was low over the eastern Caroline Islands. At 2 p. m., December 1, a definite center appeared west of Truk Island and moved W. by N. to latitude 8.30, longitude 146.30 where it shifted to a northerly course for a short time during the forenoon of

December 3, then changed to the NW., and passed about 120 miles SW. of Guam the morning of December 4. The typhoon gradually inclined from a NW. course to the W. as it progressed across the ocean, and the morning of December 8 found it about 480 miles east of N. Luzon (lat. 17.50, long. 129). It began to move more rapidly at this time and was located between Tuguegarao, Cagayan Province, and Echague, Isabela Province, on the morning of December 9, moving SW., much decreased in intensity. It continued across central Luzon, and entered the China Sea close to and north of Iba, Zambales Province. On December 10, it was a depression in the China Sea about 150 miles WSW. of Manila. Gradually inclining to a WSW. and then a W. course, it reached the coast of Indochina and passed inland north of Padaran the morning of December 12.

Typhoon December 6 to 9.—As the preceding typhoon was moving across the ocean, a second disturbance appeared about 420 miles SE. of Guam. It moved W. by N. for a short time, then WNW. and filled up December 9 about 300 miles NNW. of Yap.

Typhoon, December 17 to 26.—On December 16, a depression over the eastern Caroline Islands moved WNW. and intensified into a typhoon about 300 miles SSE. of Guam (Dec. 17, 6 a. m.). It now began to move NW., gradually inclining to the WNW. as it reached the fourteenth parallel of latitude. On December 21 it was moving westward along 15.30° north latitude. December 22, it shifted to the WSW., and was located December 23 near latitude 14, longitude 126. From this point, it moved directly westward across southern Luzon into the China Sea, being about 50 miles SE. of Manila, December 24, 6 a. m., and about 300 miles W. by S. of Manila the morning of the 25th. It gradually filled up as it moved westward and no trace of it could be found by December 27.

Newspapers of December 31, 1935, reported that 28 lives were lost in this typhoon. Winds were violent over a small area, and the center moved quite fast across the Provinces of Camarines Norte and Sur, Tayabas, Laguna (only the southern part), and Batangas, thus minimizing the extent of damage. Near the center, houses built of strong materials were destroyed. Two ships were grounded along the northern coast of Camarines Norte and were towed into deeper water after the typhoon passed. Light material structures suffered extensive damage.

CLIMATOLOGICAL TABLES

CONDENSED CLIMATOLOGICAL SUMMARY

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Condensed climatological summary of temperature and precipitation by sections, December 1935

[For description of tables and charts, see REVIEW, January, p. 37]

Section	Temperature								Precipitation					
	Section average	Departure from the normal	Monthly extremes						Section average	Departure from the normal	Greatest monthly		Least monthly	
			Station	Highest	Date	Station	Lowest	Date			Station	Amount	Station	Amount
	° F.	° F.		° F.			° F.		*In.*	*In.*		*In.*		*In.*
Alabama	41.2	−6.3	Bay Minette	78	[1] 9	Valley Head	7	26	4.24	−.67	Wadley	6.51	Riverton	1.18
Arizona	44.8	+.3	Quartzsite	83	3	Flagstaff	−1	31	.79	−.40	Ruby	2.10	Agua Caliente	T
Arkansas	37.6	−5.0	Magnolia	73	1	Lead Hill	−4	30	2.95	−1.31	Lutherville	5.95	Clarendon	.76
California	45.9	+.3	2 stations	83	1	Sierraville	−14	16	2.46	−1.21	Upper Mattole	14.37	Mercey Hot Springs	.08
Colorado	27.6	+2.2	Buena Vista	77	19	2 stations	−25	[1] 15	.36	−.54	Sapinero	1.90	3 stations	.00
Florida	52.6	−7.3	6 stations	84	9	Cottage Hill	17	27	2.73	−.03	Garniers	8.16	Chapman Field Garden	.29
Georgia	40.8	−7.1	2 stations	77	8	Blairsville	0	31	2.75	−1.48	Tallapoosa	5.18	Hazlehurst	1.50
Idaho	25.0	−.9	do	55	[1] 11	Obsidian	−24	17	1.36	−.61	Roland	5.95	Challis	.10
Illinois	25.7	−4.7	Sparta	64	9	Danville	−15	27	1.22	−1.03	Golconda	2.21	Jacksonville	.70
Indiana	25.6	−6.5	Shoals	62	8	Marengo	−23	30	1.61	−1.25	La Porte	3.00	Frankfort	.80
Iowa	22.4	−1.5	Keokuk No. 2	59	9	Spencer	−19	26	.95	−.24	Monroe	2.06	Onawa	.15
Kansas	33.8	+1.0	Medicine Lodge	65	22	Centralia	−3	27	.27	−.58	Sedan	1.46	4 stations	T
Kentucky	30.0	−7.8	Harlan	63	9	2 stations	−14	[1] 27	2.39	−1.46	Flemingsburg	4.32	Franklin	1.21
Louisiana	48.1	−4.2	Port Sulphur	80	8	Tallulah	15	27	5.72	+.33	Woodworth	9.23	Bastrop	2.32
Maryland-Delaware	30.0	−5.4	Ferry Landing, Md.	66	9	Oakland, Md	−22	22	2.50	−.65	Friendsville, Md	5.45	Fallston, Md	1.43
Michigan	22.4	−2.8	Flint	51	1	Fife Lake	−24	29	1.38	−.70	Calumet	3.69	Iron River (near)	.33
Minnesota	14.3	−1.2	Pipestone	48	8	Big Falls	−33	20	.78	−.01	New Ulm	2.31	Alexandria	.15
Mississippi	41.9	−6.3	3 stations	73	[1] 7	West Point	10	27	3.90	−1.41	Poplarville	8.20	Holly Springs	.37
Missouri	30.7	−3.3	Doniphan	66	8	Greenville	−11	30	1.13	−.92	Fisk	2.79	Conception	.21
Montana	26.4	+3.4	Flatwillow (near)	68	6	Frazer	−27	25	.37	−.51	Heron	2.95	2 stations	.00
Nebraska	28.6	+2.1	3 stations	62	[1] 2	Gordon	−17	25	.29	−.41	Madison	1.12	Alma	.00
Nevada	32.9	+2.1	Logandale	70	[1] 1	Marlette Lake	−11	13	.87	−.10	Marlette Lake	3.26	2 stations	.13
New England	22.9	−3.6	Plymouth, Mass	56	9	Enosburg Falls, Vt	−24	29	1.34	−1.93	Bar Harbor, Maine	3.67	Springfield, Mass	.63
New Jersey	28.9	−4.8	3 stations	60	[1] 9	Runyon	−14	31	1.67	−1.98	Pleasantville	4.10	Culvers Lake	.75
New Mexico	33.6	−.3	2 stations	72	[1] 7	Therma	−21	17	.50	−.19	Jewett Ranger Station	1.91	6 stations	.00

[1] Other dates also.